

Notice of Allowability

Application No.

10/725,078

Examiner

Tuan Quach

Applicant(s)

OGIHARA, MITSUHIKO

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☐ This communication is responsive to _____.
2. ☒ The allowed claim(s) is/are 1-15.
3. ☒ The drawings filed on 02 December 2003 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
 - * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date 12/2/03
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____


Tuan Quach
Primary Examiner

REASONS FOR ALLOWANCE

The following is an examiner's statement of reasons for allowance:

Claims 1-15 are allowed primarily because the prior art do not teach or fairly suggest the combination or modification and motivation thereof to arrive at the claimed limitations of the claimed invention as claimed in claims 1 and 9 including a semiconductor structure comprising a first semiconductor epitaxial layer which has a narrower energy band gap than a second semiconductor epitaxial layer and includes two epitaxial sublayers of opposite conductivity types and a pn junction at the interface between the two sublayers as characterized in claim 1 lines 4, 5, and 8-10, and in claim 9 lines 7 and 10-12.

The prior art cited by applicant include the Okuno article and JP 11-340501. Okuno as shown in the translation provided a non-doped active layer, e.g., in Fig. 1, or a p-type active layer, e.g., in Fig. 2.3(b), between a p-type cladding layer and an n-type cladding layer.

The prior art made of record include Kajita et al., Valster et al., Ogiwara et al., Matsubara et al., and Wipiejewski. Kajita et al. (4,510,515) teach epitaxial wafer having an active layer of N-doped GaP having a pn junction but appear to employ a non-doped layer 6 and a nitrogen doped layer 7 and further do not teach the active layer to have a narrower band gap. Valster et al. (5,204,869) teach LED structure comprising active layer between cladding layers wherein mixed crystal of the active layer is more strongly ordered. Ogiwara et al. (6,180,961) teach LED structure including cladding layers having higher band gap sandwiching an active layer but fails to show any epitaxial and oppositely

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doped sublayers therein and a pn junction at the interface therebetween.

Matsubara et al. (6,337,536) teach an LED structure comprising a substrate, a buffer layer, an n-type cladding layer, a single or multiple quantum well active layer, a p-type cladding layer. Wipiejewski (6,716,659) teaches an LED structure including a substrate, a curved depression layer, a Brag reflector layer sequence, and an active layer sequence containing an n-doped layer and a p-doped layer including a pn junction at the interface therebetween and appears to be the closest prior art but fails to teach the limitation regarding the band gap and further appears to correspond to a structure substantially different from those of the remaining prior art. Conversely, the teachings in Valters et al. and Ogihira et al. regarding the wider band gap of the cladding layers as opposed to that of the active layer appear to be with regard to the cladding layers which are not shown in Wipiejewski which employs a different structure including curving depression not employed in Valster et al. or Ogihira et al. There appears to be no teaching to modify Wipiejewski and motivation therefor to arrive at the claimed limitations in the claimed inventions as delineated above.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Quach whose telephone number (571) 272-1717. The examiner can normally be reached on M - F from 8 to 4.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-1562.



Tuan Quach
Primary Examiner